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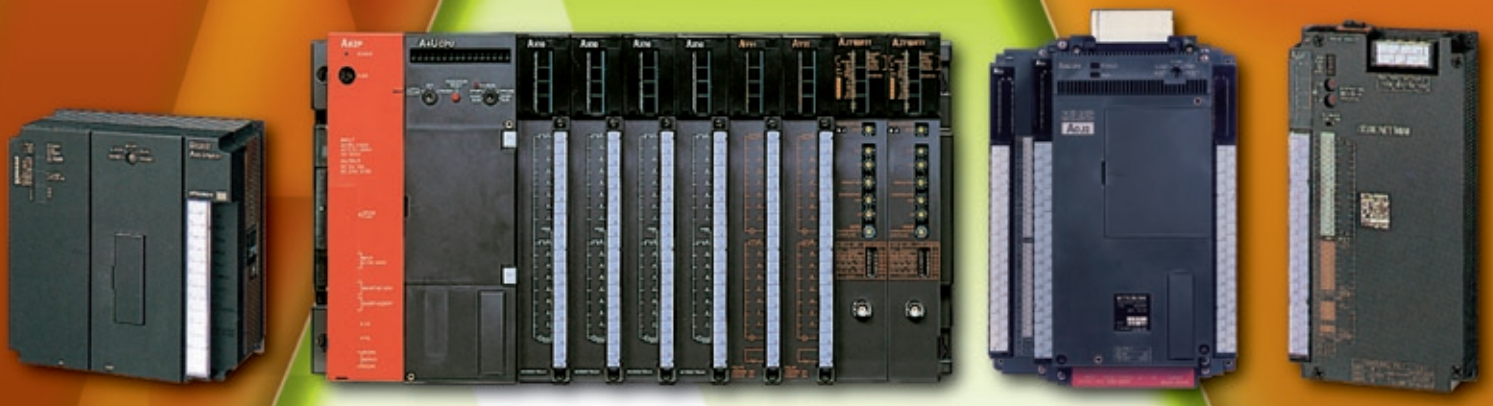
Mitsubishi Programmable Controllers MELSEC-A/QnA Series Transition Guide

From the MELSEC-A/QnA Series to the

MELSEC-Q Series

A·Q

Comprehensive, risk-free upgrade solutions



Aug. 2012 Edition

From the MELSEC-A/QnA Series

➡ The MELSEC-Q Series

Complete Support for A/QnA Series Upgrades

Mitsubishi Electric offers a carefully engineered combination of hardware, software, and support designed to allow you to upgrade legacy A and QnA Series controller systems to the current MELSEC-Q Series with minimum disruption to your plant operations.

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→ Replacement handbooks

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A Q

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CC-Link

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Support

At-a-glance technical overviews

Technical Bulletins

		〈Date of discontinuation〉	〈Technical bulletin〉
Large type A/QnA Series			
A/QnA (large type)	●CPU module	End of Sep. 2006	T99-0050
	●I/O module	End of Sep. 2006	T99-0050
	●Special function module	End of Sep. 2006	T99-0050
	●Data link module (MELSECNET(Ⅱ), MELSECNET/B module, etc.)	End of Sep. 2006	T99-0050
A2C Series			
A2C	●CPU module	End of Sep. 2006	T99-0050
	●A2C I/O module	End of Sep. 2008	T99-0070
	●Special function module etc.	End of Sep. 2008	T99-0070
PC interface board			
MELSECNET(Ⅱ), MELSECNET/B	●MELSECNET(Ⅱ), MELSECNET/B interface board	End of Sep. 2008	T99-0049
Small type AnS Series			
MELSECNET(Ⅱ), MELSECNET/B*1	●Remote I/O module	End of Sep. 2008	T99-0049
MELSECNET/MINI-S3	●AnS (small type) master module	End of Sep. 2008	T99-0070
	●I/O module	End of Sep. 2008	T99-0070
A0J2(H) Series			
A0J2(H)	●CPU module	End of Sep. 2008	T99-0069
	●Power supply module	End of Sep. 2008	T99-0069
	●I/O module	End of Sep. 2008	T99-0069
	●Special function module etc.	End of Sep. 2008	T99-0069

*1: Production of AnS Series master/local station data link modules (A1SJ71AP21, A1SJ71AR21, and A1SJ71AT21B) will be continued.

Please check the Technical Bulletin "Repair acceptance of discontinued models (FA-A-0049)" for the repair acceptance period of the above discontinued products.

In-depth technical documentation resources

Replacement Handbooks

Transition from MELSEC-A/QnA (Large Type) Series to Q Series Handbook

●Fundamentals	L(NA)08043ENG
●Intelligent Function Modules	L(NA)08046ENG
●Network Modules	L(NA)08048ENG
●Communication Modules	L(NA)08050ENG

Transition from MELSEC-A0J2H Series to Q Series Handbook

L(NA)08060ENG

Transition from MELSECNET/MINI-S3, A2C (I/O) to CC-Link Handbook

L(NA)08061ENG

Transition from MELSEC-I/OLINK to CC-Link/LT Handbook

L(NA)08062ENG

Transition from MELSEC-A/QnA (Large Type) Series to AnS/Q2AS (Small Type) Series Handbook

L(NA)08064ENG

Transition of CPUs in MELSEC Redundant System Handbook (Transition from Q4ARCPU to QnPRHCPU)

L(NA)08117ENG

MELSEC-A/QnA Series Transition Examples

L(NA)08121ENG

- For the products shown in handbooks for transition, catalogues, and transition examples, refer to the manuals for the relevant products and check the detailed specifications, precautions for use, and restrictions before replacement.
  For the products manufactured by Mitsubishi Electric Engineering Co., Ltd., Mitsubishi Electric System & Service Co., Ltd., and other companies, refer to the catalogue for each product and check the detailed specifications, precautions for use, and restrictions before use.
  The manuals and catalogues for our products, products manufactured by Mitsubishi Electric Engineering Co., Ltd., and Mitsubishi Electric System & Service Co., Ltd., are shown in Appendix of each handbook for transtion.
- Products shown in this handbook are subject to change without notice.

MEMO

Automatic Program Conversion: GX Developer & Q Conversion Support Tool

Minimize program conversion efforts by using GX Developer's PLC Type Change function and the Q Conversion Support Tool.

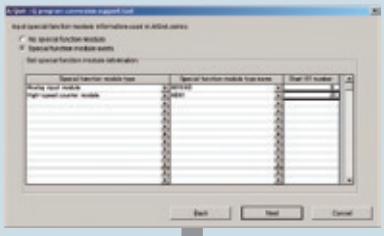
■The Q Conversion Support Tool boosts productivity by avoiding time spent consulting manuals for guidance on finishing program conversions.

Change to Q beforehand

Convert A/QnA programs to Q programs with GX Developer's PLC Type Change function.

A/QnA program (Original project) → PLC type change **GX Developer** → Q program (Converted project)

Enter the configuration information on the existing A/QnA special function modules.

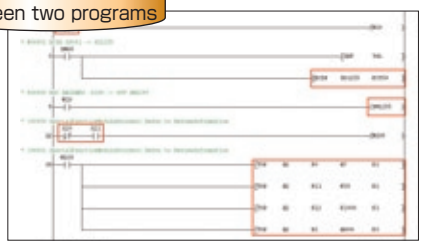


A/QnA → Q conversion support tool

Output

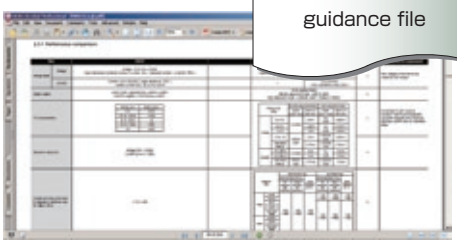
Differences between the two programs and guidance on how to complete the conversion are displayed.

Differences between two programs



<See 1 on p. 8.>

HTML conversion guidance file



<See 2 on p. 9-10.>

Point 1
- No need to manually compare the existing program with the converted program!

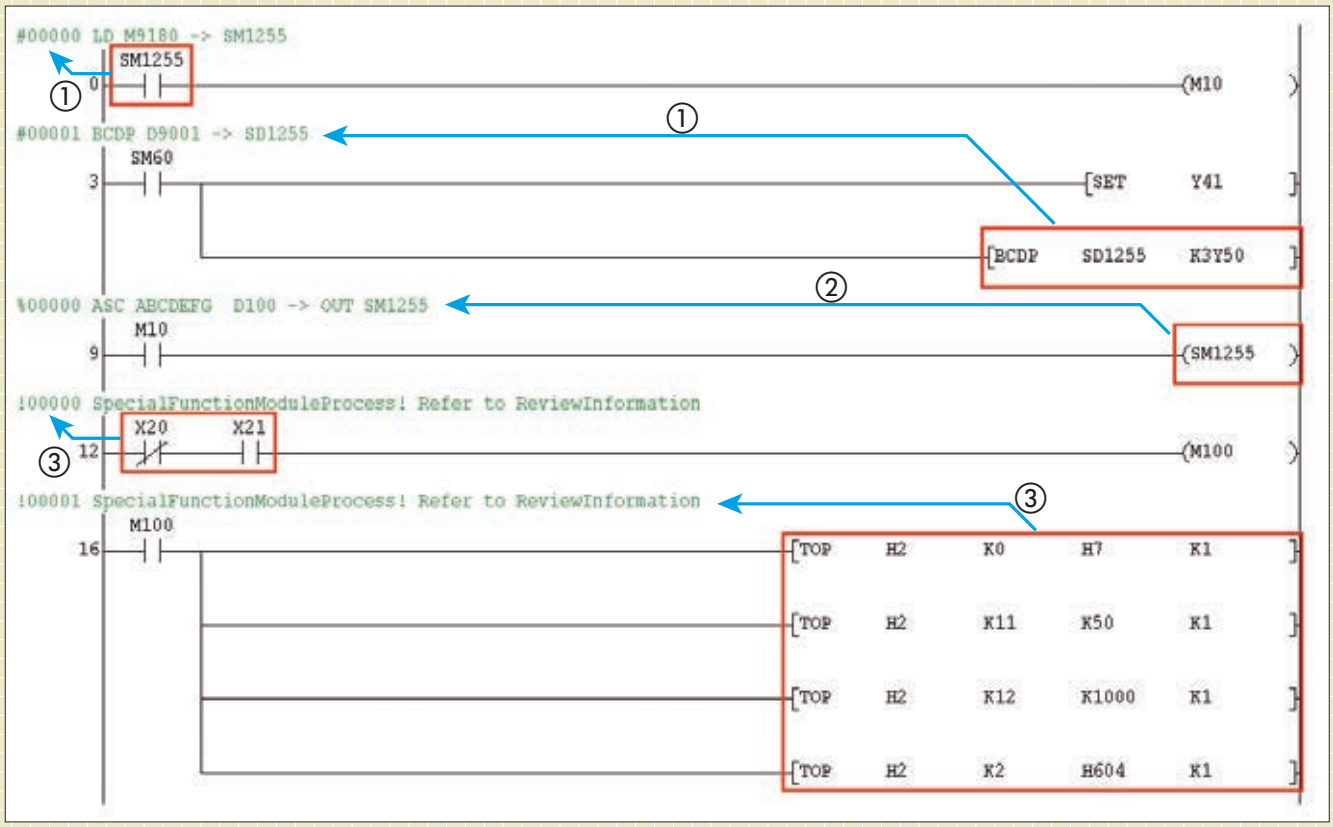
Point 2
- A list of unconverted instructions and devices is displayed.
- Information on recommended products for unconvertible special function modules is displayed.

Note 1: This support tool applies to ladder programs only.
Note 2: Conversion from AnS/Q2AS(H) programs to Q programs is also supported.
Note 3: The A/QnA → Q Conversion Support Tool does not support Universal model (QnU) CPUs. To convert a CPU to a Universal model QCPU, perform the following procedure.
① Using GX Developer, change the PLC type of the original project to a PLC type which is supported by the A/QnA → Q Conversion Support Tool. (Converted project 1)
② Again using GX Developer, change the PLC type of the original project to Universal model QCPU. (Converted project 2)
③ Open the original project and the converted project 1 in the A/QnA → Q Conversion Support Tool.
④ Reflect the output result from step 3 to the converted project 2.

Soon to be supported by
Universal model QCPU (QnU)

1 Differences between the two programs

■Can be modified directly.
Prevents mistakes and improves efficiency.



〈Image of differences between the two programs〉

①Statement of unconverted devices—#
The original device and the converted device are displayed as shown below. The devices contained in the circuit block are displayed one line at a time.
(E.g.) #00001 ANI M9201 → SM1255
("#00001" is a search keyword in the HTML conversion guidance file.)

②Statement of unconverted instructions—%
The original instruction and the converted instruction are displayed as shown below. The instructions contained in the circuit block are displayed one line at a time.
(E.g.) %00001 [LRDP K3 D10 D100 K3] → OUT SM1255
("%00001" is a search keyword in the HTML conversion guidance file.)

③Statement of special function module processes—!
For the special function module instructions (FROM, DFRO, TO, DTO and instructions using X/Y devices), a message requesting review is displayed.
(E.g.) !00001 Spefical Function Module Process! Refer to ReviewInformation
("!00001" is a search keyword in the HTML conversion guidance file.)

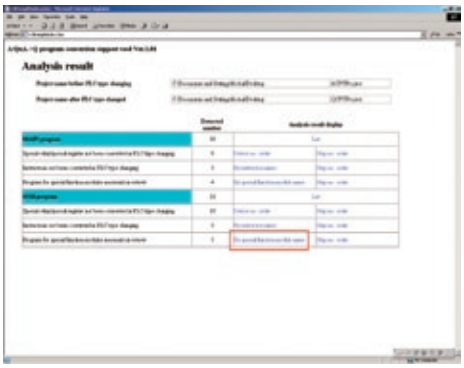
Automatic Program Conversion: GX Developer & Q Conversion Support Tool

2 HTML conversion guidance file

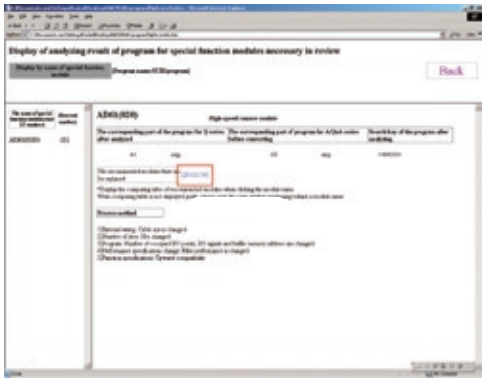
■Easy comparison of performance specifications before and after replacement.

Detailed information is displayed hierarchically in your web browser. Information on the differences between the two programs and the conversion guidance file are linked together.

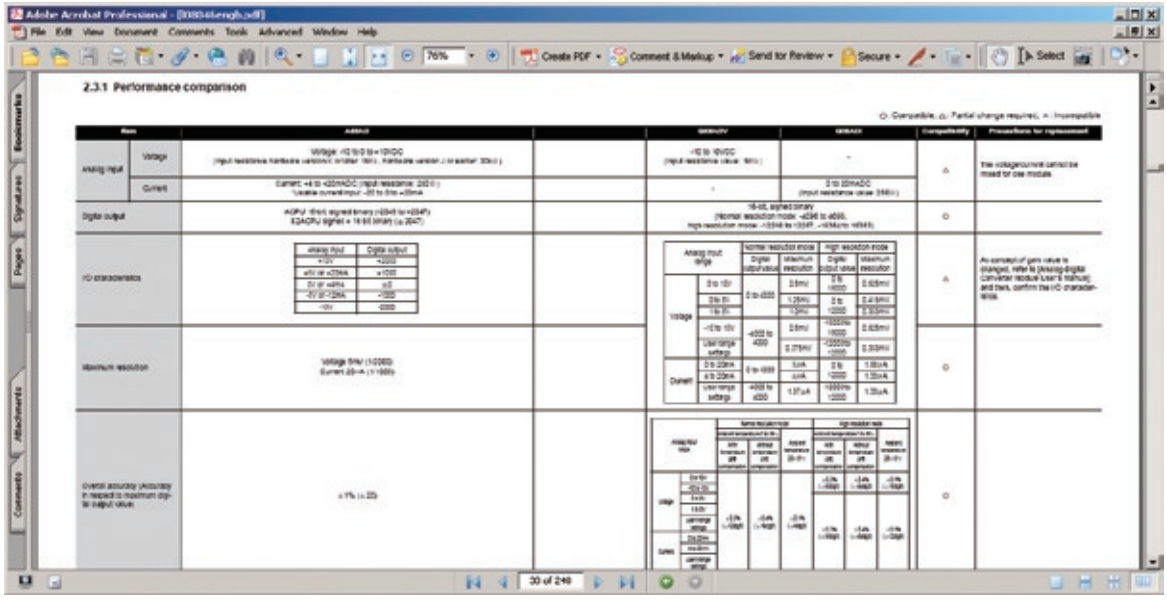
(Example 1) Special function module processes which need to be reviewed



Click "By special function module name" in the "Programs for special function modules necessary in review" row.

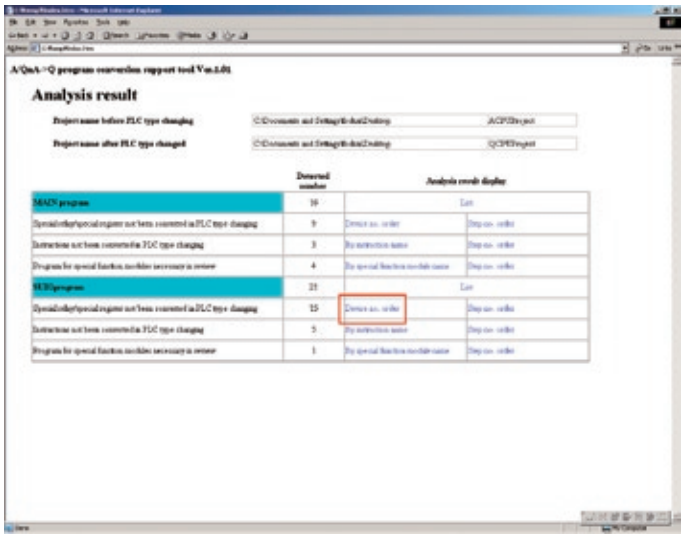


Click the recommended module name next to "The recommended modules that can be replaced."

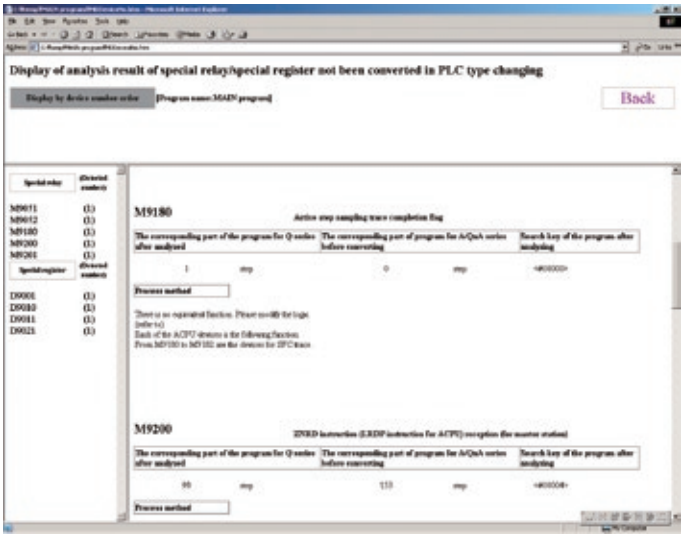


■Details of unconverted special relays and registers can be displayed, improving conversion efficiency.

(Example 2) Special relays and registers which are not converted in the Q program



Click "Device no. order" in the "Special relay/special register not been converted in PLC type changing" row.



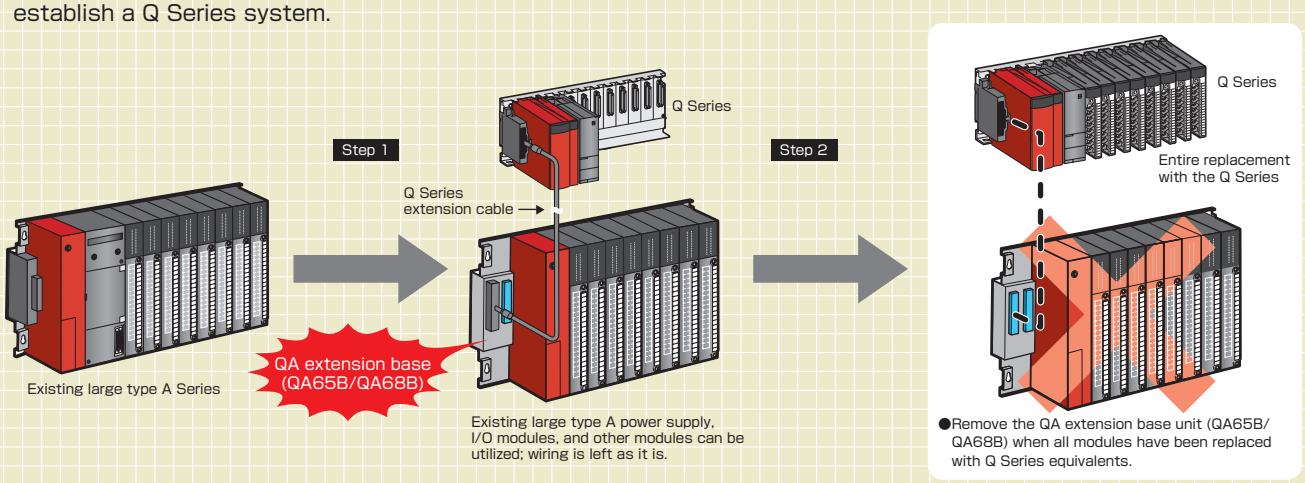
For Large Type A/QnA Series

QA Extension Base Unit (QA65B / QA68B)

Replace CPU to Q Series CPU while using existing A series modules. Use existing A Series modules when upgrading to QCPU.

■Gradual transition from large type A Series to Q Series (Q mode).

●Construct a system that is controlled by the new Q Series CPU (Q mode) while keeping the existing large type A Series modules mounted to a QA6□B extension base unit. The A Series modules can gradually be replaced to fully establish a Q Series system.



●It is recommended to use QA6□B extension base units to gradually upgrade from A Series system to Q Series system while using the assets of large type A series system. (The QA6□B extension base units are compatible with High Performance Model QCPUs only. Basic Model QCPUs, Process CPUs, Redundant CPUs, Safety CPUs,Universal Model QCPUs, and Remote I/O Stations are not compatible.)

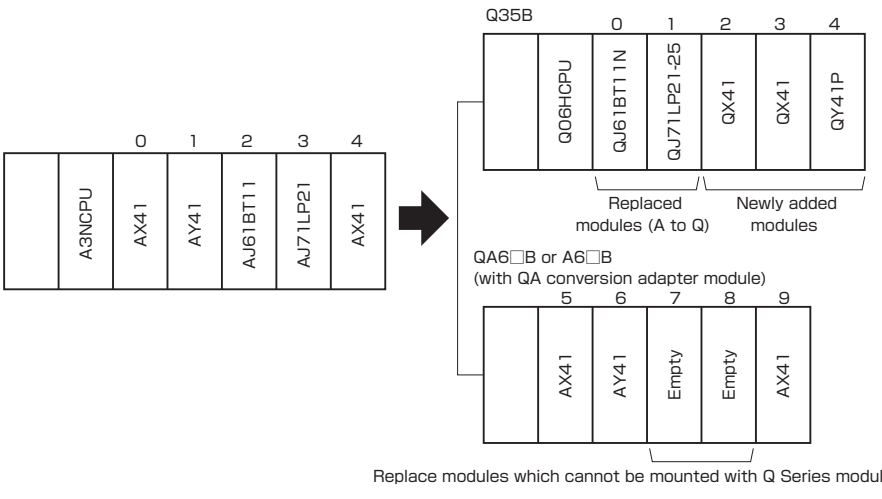
●Please refer to the "QA65B/QA68B Extension Base Unit User's Manual (IB(NA)-0800158)" for details of modules that can be mounted on the QA6□B extension base units.

QA1S65B/QA1S68B Extension Base Unit

·The small type AnS/Q2AS Series modules can also be used by connecting as a QCPU extension base.
·These extension base units can be used with QA65B and QA68B.

■Reduce conversion effort by using the same I/O addressing

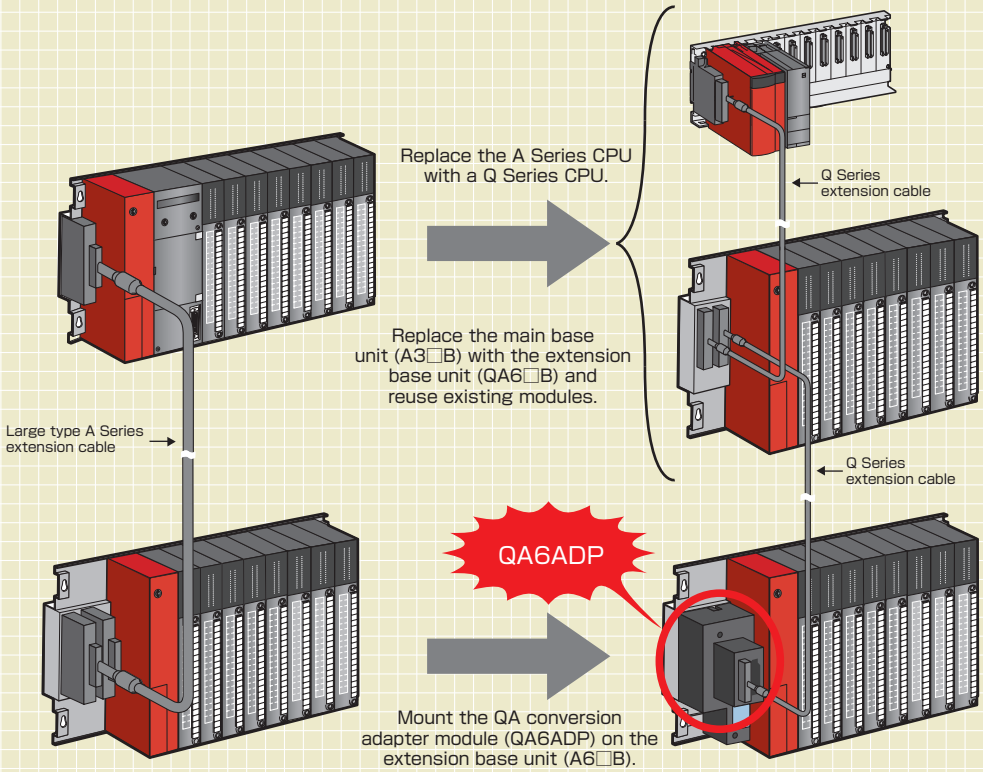
When reusing existing modules with a Q Series CPU, it is not required to change the I/O number of the existing modules. For new module(s) on the main base unit, assign a number after the existing modules in the I/O assignment settings. This can greatly reduce the program modification time.



QA Conversion Adapter Module (QA6ADP)

Use existing A/QnA extension base units when upgrading to QCPU.

■Mount a QA conversion adapter module to use existing A Series extension base units with a Q Series CPU.



Notes

- The QA6ADP adapter cannot be connected to a QA1S extension base unit, which is used to mount small type AnS/Q2AS Series modules.
- The QA6ADP adapter is compatible with High Performance Model QCPUs only. Basic Model QCPUs, Process CPUs, Redundant CPUs, Safety CPUs, Universal Model QCPUs, and Remote I/O Stations are not compatible.
- Modules which can be mounted on the extension base unit (A6□B) are the same as when QA6□B is used.
- An adapter module mounting bracket is required to mount the QA6ADP adapter. Follow the instructions in the user's manual when mounting.
- When an AC input module is mounted on the "A5□B" extension base unit (without power supply) using the QA6ADP, either the "A6□B with QA6ADP" or "QA6□B" extension base unit (with power supply) is required in the system.

Note: Assign the I/O numbers in the following order: Q Series to A Series or A Series to Q Series.
When the order is mixed (i.e., Q Series → A Series → Q Series), an error will occur in the CPU.

■Example of I/O assignment

		Model	Type	Point	Address
Main base unit	0	QJ61BT11N	Intelli.	32 points	100
	1	QJ71LP21-25	Intelli.	32 points	120
	2	QX41	Input	32 points	140
	3	QX41	Input	32 points	160
	4	QY41P	Output	32 points	180

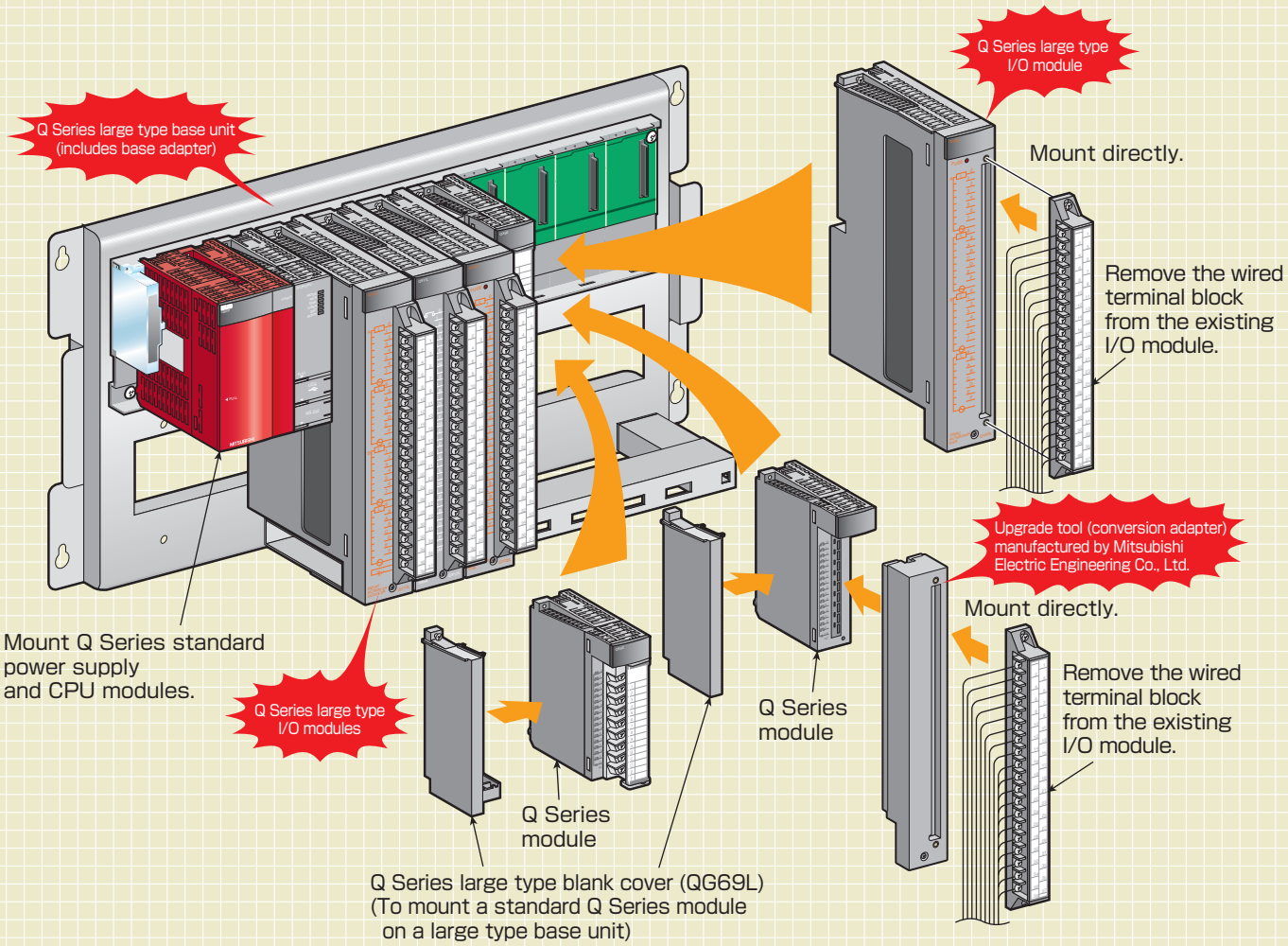
		Model	Type	Point	Address
Extension base unit	5	AX41	Input	32 points	00
	6	AY41	Output	32 points	20
	7	——	Empty	32 points	40
	8	——	Empty	32 points	60
	9	AX41	Input	32 points	80

Q Series Large Type Base Unit, I/O Module (Q38BL・Q35BL・Q68BL・Q65BL・Q55BL・QX11L・QX21L・QY11AL・QY13L・QY23L・QY51PL・QG69L)

Permits Q Series upgrade with existing 32-point I/O wiring.

■Minimize wiring modifications by reusing existing A Series 32-point I/O wiring.

■No need to make new mounting holes. The hole size and pitch of the Q Series large type base units are the same as those of large type A Series.



·Q Series power supply and CPU modules can be used without any modification (Q Series large type blank cover is not necessary).

·Q Series large type I/O modules can be used with Q Series modules. (Some modules, such as the ones that occupy two slots, cannot be mounted. For details, please refer to Q Series Large Type Base Unit User's Manual (IB-0800408).)

Notes

●Through the use of an upgrade tool (manufactured by Mitsubishi Electric Engineering Co., LTD., refer to page 15), terminal block modules that are not compatible with the Q Series large type I/O modules can be mounted without rewiring.

●For compatibility of Q Series large type base unit and upgrade tool, refer to page 16.

■Q Series large type base unit options

Product name	Model	Outline
Main base unit	Q38BL	8 slots, 1 power supply module required, Q Series large type I/O module mountable
	Q35BL	5 slots, 1 power supply module required, Q Series large type I/O module mountable
Extension base unit	Q68BL	8 slots, 1 power supply module required, Q Series large type I/O module mountable
	Q65BL	5 slots, 1 power supply module required, Q Series large type I/O module mountable
	Q55BL	5 slots, power supply module not required, Q Series large type I/O module mountable

■Q Series large type I/O module options

Product name	Model		Outline
	Existing A Series module	Q Series large type module	
Input module	AX11	QX11L	32 points; 100 to 120 V AC; rated input current: 10 mA (100 V AC, 60 Hz); response time: 15 ms or less (OFF to ON), 25 ms or less (ON to OFF); 32 points/common; 38-point terminal block
	AX21	QX21L	32 points; 200 to 240 V AC input; rated input current: 10 mA (220 V AC, 60 Hz); response time: 15 ms or less (OFF to ON), 25 ms or less (ON to OFF); 32 points/common; 38-point terminal block
Output module	AY10A AY11A	QY11AL	16-point contact output, 24 V DC/240 V AC, 2 A/point, 16 A/all points, all points independent common, 38-point terminal block, surge suppressor (varistor 387 to 473 V)
	AY13	QY13L	32-point contact output, 24 V DC/240 V AC, 2 A/point, 5 A/common, 8 points/common, 38-point terminal block
	AY23	QY23L	32-point triac output, 100 to 240 V AC, 0.6 A/point, 2.4 A/common, 8 points/common, 38-point terminal block
	AY51 AY51-S1	QY51PL	32-point transistor output (Sink), 12/24 V DC, 0.5 A/point, 4 A/common, 16 points/common, 38-point terminal block
Large type blank cover	N/A	QG69L	Blank cover for mounting existing Q Series module on the Q Series large type base unit

Note

●The Q Series large type base units and I/O modules are compatible with High Performance Model QCPUs, Universal Model QCPUs (except for Q00UJCPU), and MELSECNET/H Remote I/O Stations.
The following CPUs and system are not compatible:
・Basic Model QCPUs, Process CPUs, Redundant CPUs, and Safety CPUs
・Q00UJCPU

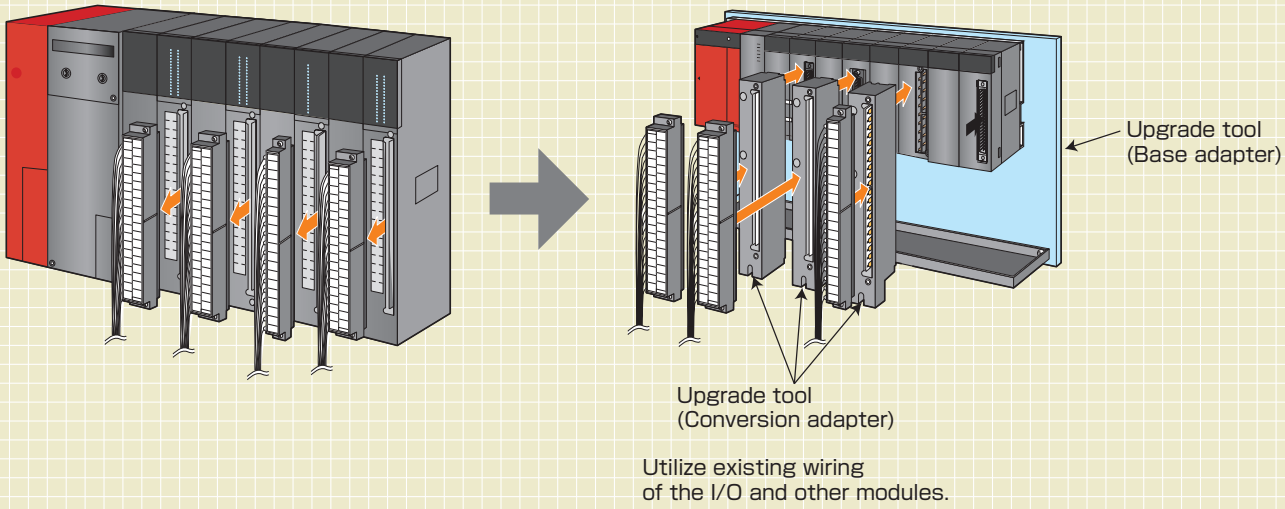
Upgrade Tool

Replace A Series systems with Q Series without extensive I/O rewiring.

■Upgrade tool features

The upgrade tool consists of two parts: a conversion adapter that modifies existing wiring of the large type A Series input/output/analog/high-speed counter modules to correspond to the Q Series modules; and a base adapter to mount Q Series base units and secure the bottom part of the conversion adapters.

- ●Remove the large type A Series programmable controllers along with the base unit, install the base adapter in the same position, and mount Q Series modules. (New installation holes are unnecessary when mouting the base adaptor)
- ●Attach the conversion adapters to the Q Series modules.
- ●Remove the terminal blocks from the existing large type A Series modules and mount them on the conversion adapters. (The existing wiring can be used without modification.)



For detailed specifications, precautions, and restrictions of the upgrade tool, please refer to the brochure (SAN C033E-04Z) and user's manual.
For the upgrade tool, please contact your local Mitsubishi sales office or representative.

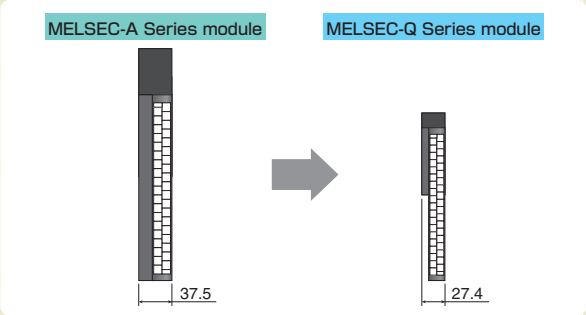
Compatibility of Q Series large type base unit and upgrade tool

■Compatibility of Q Series large type base unit and base adapter/conversion adapter (upgrade tool manufactured by Mitsubishi Electric Engineering Co., Ltd.)

Item			Q Series large type base unit*1	Base adapter·Conversion adapter (Upgrade tool)*1
Slot width of base unit*2			Same width as the large type A Series base unit (37.5mm)	Same width as Q Series base unit (27.4mm)
Mountable module	Power supply module	Q Series standard power supply module	○	○
	CPU module	Basic model QCPU	×	○
		High Performance model QCPU	○	○
		Process CPU	×	○
		Universal model QCPU	○*3	○
	・I/O module ・Intelligent function module	Q Series large type I/O modules*4	○	×
		Q Series module (occupies 1 slot)	○*6	○
		Q Series module (occupies 2 slots)	×	○
Conversion adapter*5	For terminal block type 16-point I/O module (occupies 1 slot)		○*6	○
	For terminal block type 32-point I/O module (occupies 1 slot)		○*6	△*8
	For terminal block type 32-point I/O module (occupies 2 slots)		×	△*9
	For high-speed counter module		○*6	△*8
	For analog module (occupies 1 slot)		○*6	△*8
	For analog module (occupies 2 slots)		×	△*9
Connection of QA/QA1S extension base unit*7			○	○

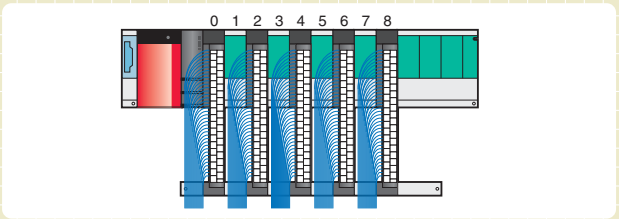
○: Applicable (Mountable)　△: Applicable with restrictions (Mountable)　×: Not Applicable (Not mountable)

*1: Q Series large type base units can be used with Q Series standard base units. (The base adaptor manufactured by Mitsubishi Electric Engineering Co., Ltd. is applicable to Q Series standard base unit.)
*2: Check mounting conditions before using the upgrade tool, because wiring space is reduced due to a decrease in the module's width.

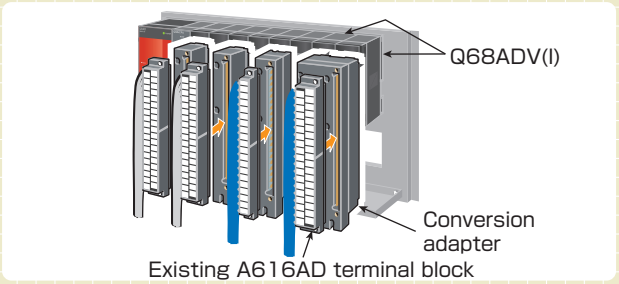


*3: Q00UJCPU is not compatible.
*4: Number of common points and electrical specifications are same as that of large type A Series I/O module.
*5: Since the adapters are mounted on Q Series modules, the specifications and functions are same as that of the Q Series modules. (Please check the transition handbook, since the specifications and functions are different from that of large type A Series module)
*6: Q Series large type blank cover (QG69L) is required.
*7: Only High Performance Model QCPUs can be connected to the QA/QA1S extension base unit.

*8: If the size of wire connected to the terminal block is larger than 1.25mm², ERNT-AQTX41, AQTY41, AQTX81, AQTY81, AQT68AD, AQT68ADN, AQT68DA, and AQTD61 modules may have a mounting difficulty. In this case, secure wiring space by leaving empty slots in between modules. For example, mount modules on slot No. 0, 2, 4, 6, 8, and leave slot No. 1, 3, 5, 7 empty. If the number of slots is insufficient, consider using the Q Series large type base unit.



*9: Can be used to replace an A616AD with two Q68ADV(I) modules and a conversion adapter. Doing so will allow the existing wired terminal blocks to be used.



Modules for Easy Replacement

A variety of modules are available to facilitate replacement.

■DC input modules compatible with 6 mA rated input current (QX41-S2, QX81-S2)

DC input modules compatible with 6 mA rated input current are available.
When replacing large type A Series modules and utilizing the external devices as they are, the existing Q Series modules may not receive signals sent from external devices, such as proximity sensors, due to incompatibility with low-rated input current, and thus, external resistors need to be installed.
With the QX41-S2 and QX81-S2 modules, which are compatible with 6 mA rated input current, external resistors are no longer required. (The existing external devices can be utilized when replacing modules.)

(Comparison of QX41-S2/QX81-S2 with large type A Series modules)

Item		Specification			
		Q Series		Large type A Series	
Model	Positive common type	QX41-S2*	QX41	AX41	AX42
	Negative common type	QX81-S2*	QX81	AX81	AX82
Number of input points		32	32	32	64
Rated input current	24 V DC	Approx. 6 mA	Approx. 4 mA	Approx. 10 mA	Approx. 7 mA
	12 V DC	(N/A)	(N/A)	Approx. 4 mA	Approx. 3 mA

* The pin arrangement is same as that of the existing A/Q Series connector type module.
Use the conversion adapter manufactured by Mitsubishi Electric Engineering Co., Ltd. when replacing a large type A Series 32-point terminal block module.

■I/O combined module (QX41Y41P) * A module with sequential I/O numbers

QX41Y41P's I/O assignment is same as that of large type A Series I/O combined module, AH42. This module can be used as the I/O module on the programmable controller side when using the A0J2 renewal tool (manufactured by Mitsubishi Electric System & Service Co., Ltd., refer to page 23) to replace the A0J2(H)CPU.
It is not necessary to change the programs when replacing AH42 or A0J2(H)CPU. (Minimize the need to modify programs)

(QH42P)

	Input(X)	Output(Y)	
00 1F	X00 ≀ X1F	Y00 ≀ Y1F	32 points

Same I/O numbers are used for input and output

(AH42, QX41Y41P)

	Input(X)	Output(Y)	
00 1F	X00 ≀ X1F	Blank	32 points
20 3F	Blank	Y20 ≀ Y3F	32 points

Sequential I/O numbers are used for input and output

■High-speed counter modules(QD62-H01, QD62-H02)

These high-speed counter modules are used to replace the large type A Series high-speed counter modules (AD61 and AD61-S1) and have the same input filtering system and counting speed.
Modules can be replaced without being restrained by the specifications of existing pulse generators (e.g. an encoder).

Counting speed switch setting	A/QnA (Large Type) Series Models	Q Series Replacement Models
50 K PPS	AD61	QD62-H01
10 K PPS	AD61-S1	QD62-H02

■Positioning module(QD73A1) New

The positioning module realizes servomotor control with a high-resolution encoder, and is compatible with a 1 Mpps maximum input pulse (x10 conventional module).
Replace the positioning module while maintaining existing external devices such as the servo amplifiers.

Positioning mode	A/QnA (Large Type) Series Models	Q Series Replacement Models
Position control mode	AD70	QD73A1
Velocity/position control switchover mode		

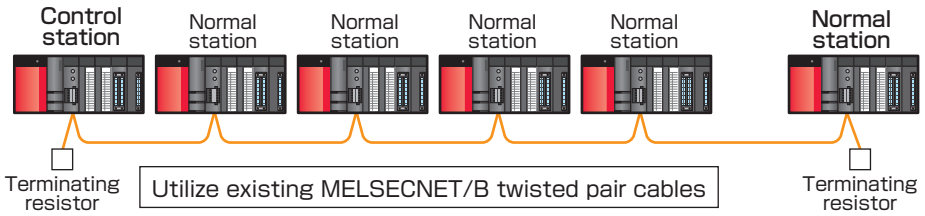
MELSECNET/H Network Module

QJ71NT11B (twisted bus type)

Utilize the existing MELSECNET/B twisted pair cables to build MELSECNET/H network systems.

■MELSECNET/H network system can be built using twisted pair cables.

Existing MELSECNET/B twisted pair cables are used to build the MELSECNET/H network system when replacing large type A Series modules (MELSECNET/B) with Q Series modules.
Modules are replaced without modifying the previously laid network cables.
A high-speed and large-volume network system can also be built using CC-Link cables.



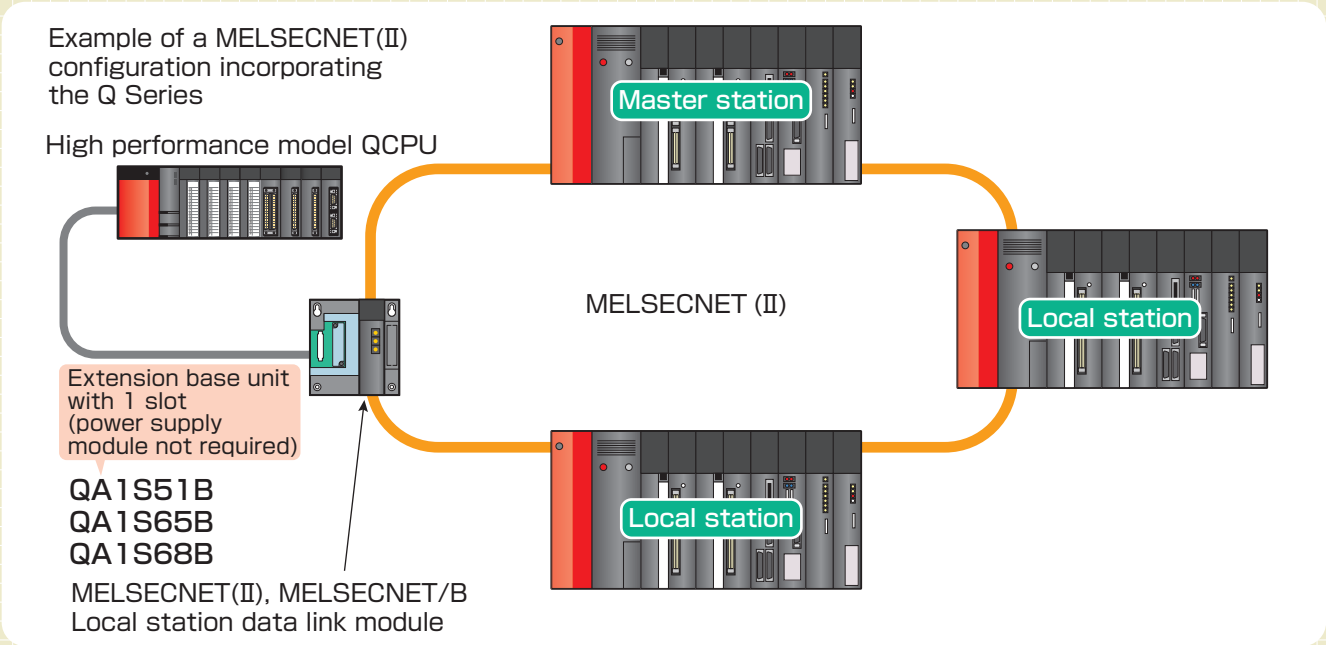
Item			Twisted bus system specification	
Number of stations per network			32 stations (1 control station, 31 normal stations)	
Cable type			Twisted pair cable	CC-Link Ver. 1.10 compatible cable
Overall distance per network			–	–
	Communication speed	156 k bps	1200 m	1200 m
		312 k bps	600 m	900 m
		625 k bps	400 m	600 m
		1.25 M bps	200 m	400 m
		2.5 M bps	(N/A)	200 m
		5 M bps		150 m
		10 M bps		100 m

MELSECNET(Ⅱ), MELSECNET/B Local Station Data Link Module (A1SJ71AP23Q, A1SJ71AR23Q, A1SJ71AT23BQ)

Upgraded AnS local station data link modules permit a direct Q Series connection to existing networks as local stations.

■Replace A Series MELSECNET(Ⅱ), MELSECNET/B stations with Q Series systems.

The MELSECNET(Ⅱ)/B local station data link modules allow a Q Series system to directly connect to existing NET(Ⅱ)/NET/B data link system via a QA1S6□B extension base unit.



■Local station data link module options

Model	Outline
A1SJ71AP23Q	MELSECNET(Ⅱ) local station data link module for SI optical fiber cable
A1SJ71AR23Q	MELSECNET(Ⅱ) local station data link module for coaxial cable
A1SJ71AT23BQ	MELSECNET/B local station data link module for shielded twisted pair cable

●Specifications

①Supported CPUs
High Performance Model QCPUs [Q02(H), Q06H, Q12H, and Q25HCPU]

②Compatible extension base units
QA1S6□B or QA6□B with A-A1S module conversion adapter (A1ADP)

③Number of modules per CPU
Send point range can be further increased by mounting up to 6 modules per CPU.

④Network parameters
Minimal setup required, as network parameters settings are automatically detected by the module.

⑤Link refresh setting
Link refresh setting is not automatically detected. Hence, FROM/TO instructions within sequence program to enable send/receive cyclic data are required.

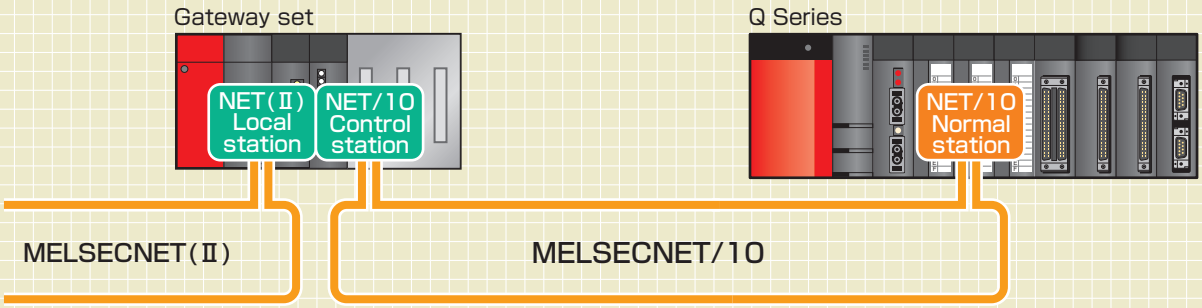
Sample programs for link refresh are provided in the "A/QnA → Q Conversion Support Tool." The sample program can be used to create a QCPU program which may reduce development time.
For details, please contact your local Mitsubishi sales office or representative.

MELSECNET(Ⅱ)-MELSECNET/10 Gateway Set (Q6KT-NETGW-□□)

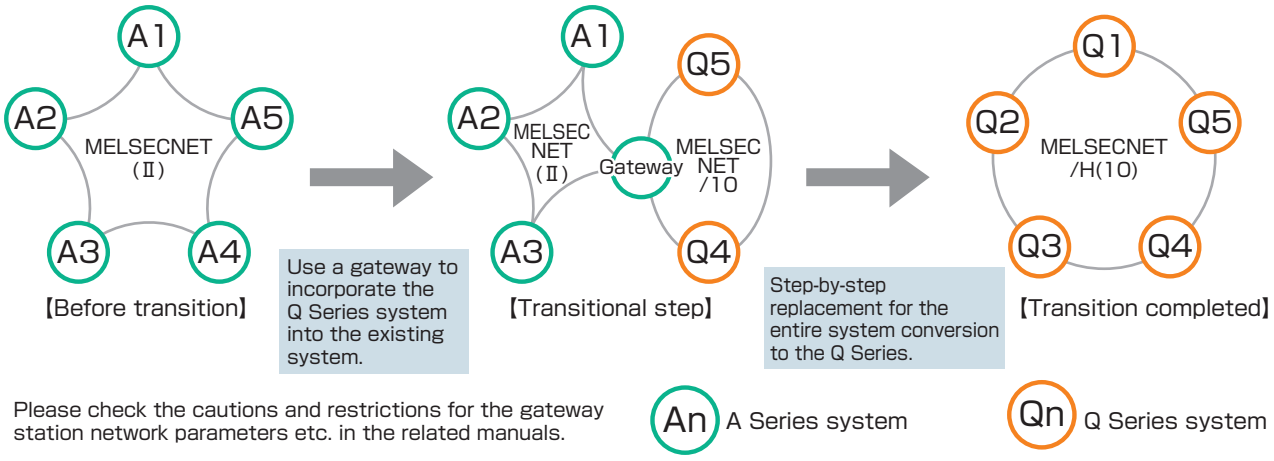
Implement gradual migration from MELSECNET(Ⅱ) to MELSECNET/10.

■Use a Q2AS based MELSECNET(Ⅱ)/10 gateway to gradually convert MELSECNET(Ⅱ) stations to MELSECNET/10. MELSECNET/10 is backwards compatible with the Q Series via MELSECNET/H.

(Example) Partial replacement of MELSECNET(Ⅱ), from large type A Series programmable controllers to Q Series programmable controllers



Step-by-step replacement with the Q Series



Please check the cautions and restrictions for the gateway station network parameters etc. in the related manuals.

An A Series system

Qn Q Series system

■Gateway set options

Set model name	Main part			MELSECNET(Ⅱ)/B part	MELSECNET/10 part
Q6KT-NETGW-SS	A1S35B	A1S61PN	Q2ASCPU	A1SJ71AP21	A1SJ71QLP21
Q6KT-NETGW-RS				A1SJ71AR21	A1SJ71QLP21
Q6KT-NETGW-RB					A1SJ71QBR11
Q6KT-NETGW-TS				A1SJ71AT21B	A1SJ71QLP21
Q6KT-NETGW-TB					A1SJ71QBR11

Reading the model name

Q6KT-NETGW-□□
Gateway set
① ②

①Network type: MELSECNET(Ⅱ)
S: SI optical fiber cable (double loop)
R: Coaxial cable (double loop)
T: Twisted pair cable (bus)

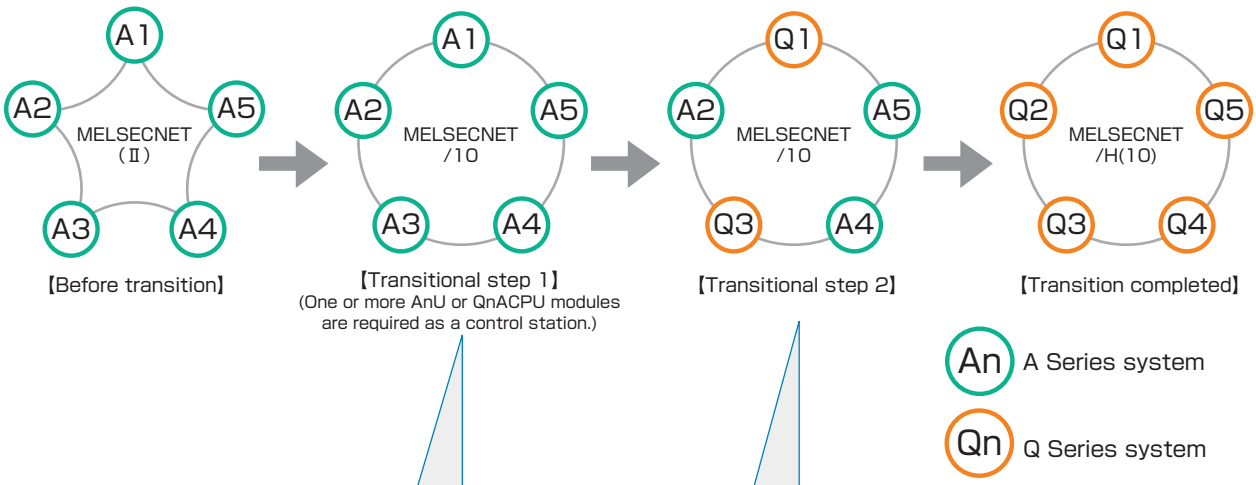
②Network type: MELSECNET/10
S: SI optical fiber cable (double loop)
B: Coaxial cable (bus)

Q Series Options with MELSECNET/10 Network Modules

Complete replacement of MELSECNET(Ⅱ) systems with MELSECNET/10 while reusing existing cable installations.

■Step-by-step transition from an A Series and Q Series combined system to a Q Series system.

Further network upgrade options are available because of the continued production of MELSECNET/10 modules.
A complete MELSECNET(Ⅱ) system can be replaced with MELSECNET/10 while reusing the existing cable installations.
Following the network replacement, the A series stations can be replaced with Q series stations as needed in a step-by-step manner.
However, the step-by-step transition is not possible if the network includes of a combination of A/QnA series and Q series stations, because the A/QnA series does not support MELSECNET/H twisted bus system.



Replace MELSECNET(Ⅱ) data link modules at all stations with MELSECNET/10 network modules, and then switch the network system over to MELSECNET/10.

- Change the MELSECNET(Ⅱ) master station to the MELSECNET/10 control station.
  Note: For CPU modules (AnNCPU and AnACPU) that cannot be set as the MELSECNET/10 control stations, please consider changing to the Q Series.
- Set the MELSECNET(Ⅱ) local stations to the MELSECNET/10 normal stations.

For stations that are to be changed from A Series systems to Q Series systems, replace the programmable controllers to the Q Series, and set them as MELSECNET/10 normal stations.
By gradually transferring the A Series systems to the Q Series systems, you will be able to complete the transition to the Q Series system.

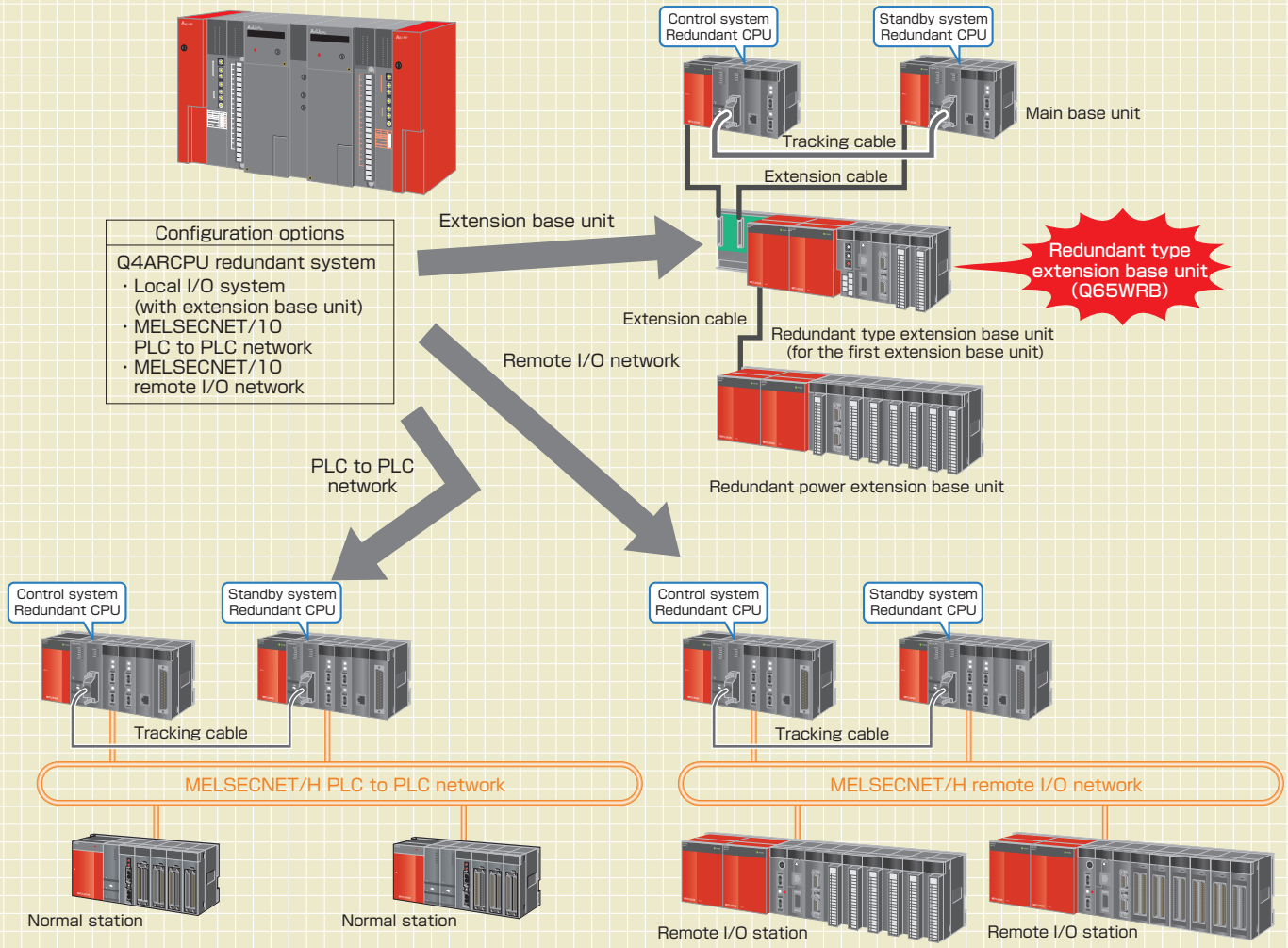
■Network module options

Product name	Model	
	Control/normal station	Remote I/O station
Large type A/QnA Series MELSECNET/10 network module	AJ71BR11 AJ71LP21 AJ71LP21G AJ71LR21 AJ71QBR11 AJ71QLP21 AJ71QLP21G AJ71QLP21S AJ71QLR21	AJ72BR15 AJ72LP25 AJ72LP25G AJ72LR25 AJ72QBR15 AJ72QLP25 AJ72QLP25G AJ72QLR25

Q Series Redundant System

Select the best-suited Q Series redundant system configuration for the application.

■Simple upgrades from legacy Q4AR installations to modern Q Series redundant systems.



■Network modules of MELSECNET/H PLC to PLC network and remote I/O network can be mounted on the Q Series redundant CPU main base. (They can be used together.)
A wide variety of system is constructed to suit the needs of the control target.

■Realizes local I/O system equivalent to Q4ARCPU using the redundant type extension base unit.

■Up to 63 modules can be mounted using the redundant type extension base unit.

■Fast system switching time at (approx.) 50 ms in the redundant local I/O system, remarkable improvement compared to the Q4ARCPU redundant system (300 ms + 1 scan time).

A0J2 Renewal Tool

Replace A0J2(H) systems with Q Series using existing wiring.

■A0J2 renewal tool features

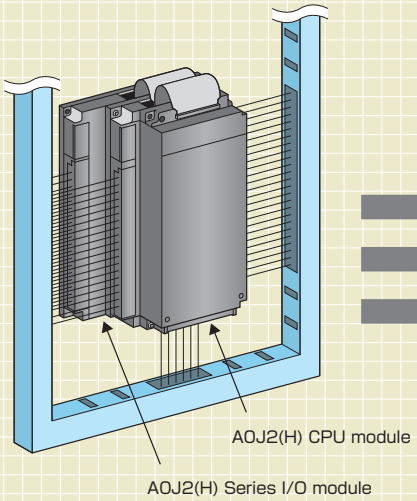
The A0J2 renewal tool is used to replace the A0J2(H) systems with Q Series systems. It consists of an interface module to which the existing wired terminal block can be mounted, and a base adapter that can be installed using the existing installation holes.
A variety of installation methods is available to fit the installation space.

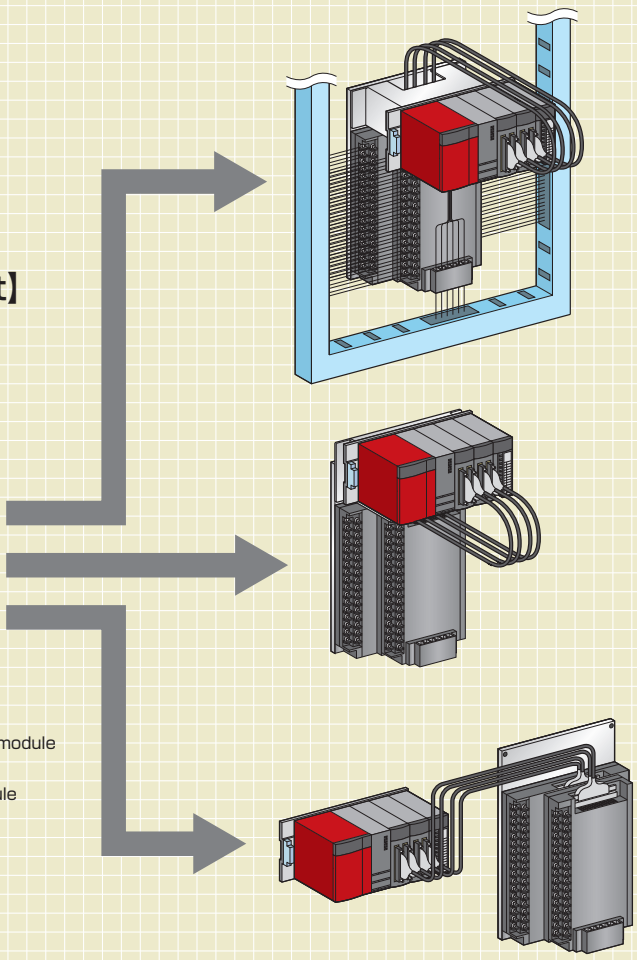
■Interface module features

The interface module has DC to relay output conversion and AC to DC input conversion functions. Hence, replacement is possible together with Q Series connector type DC I/O modules.
Dedicated cables are used to connect the interface module to Q Series I/O modules.

【After replacement】

【Before replacement】





Stackable type
Suitable when there is enough depth. Stack the programmable controller on the existing panel face.

Note: Depth of 236 mm or more is required (when two interface modules are stacked).

Flat mounting type
Suitable when there is enough space above existing modules. Mount the programmable controller above the interface module(s).

Note: Space of 92 mm or more from the top of the existing modules is required.

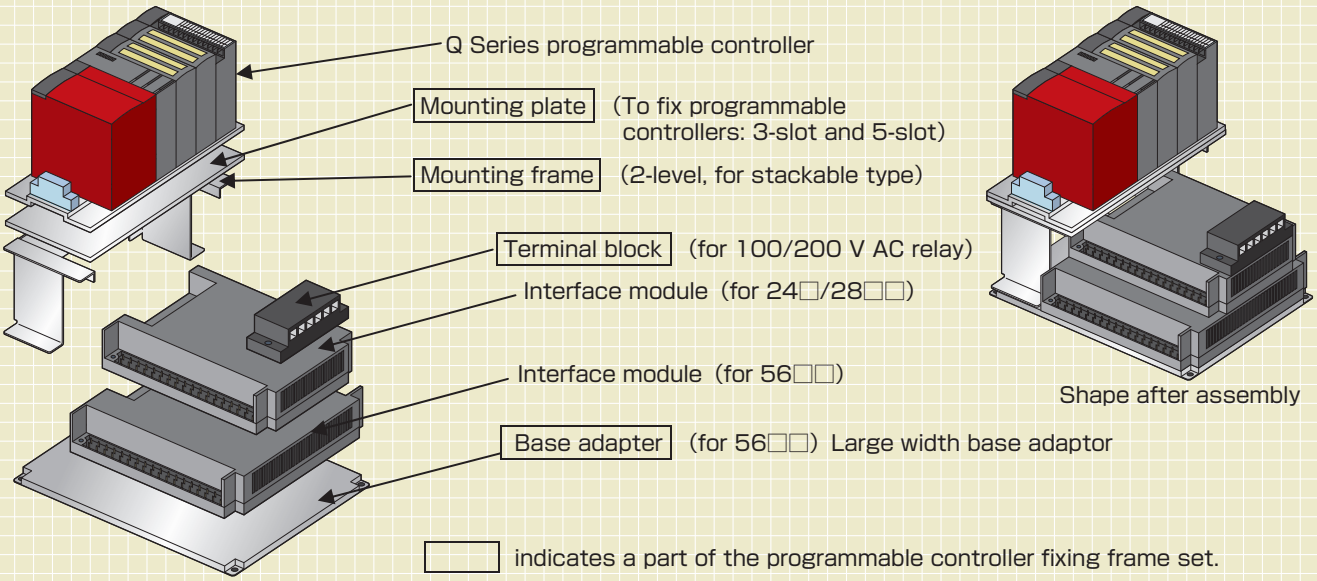
Standalone type
Mount the programmable controller separately.

Note: For the AnS Series, the standalone type only.

For detailed specifications, precautions, and restrictions of the A0J2 renewal tool, please refer to the brochure (X900904-165) and user's manual. For further information, For details of the A0J2 renewal tool, please contact your local Mitsubishi sales office or representative.

■Structure

(Example) 2-level stack, stackable type



■Basic configuration

【Before replacement】

A0J2(H) Series programmable controller
・CPU module ・I/O module

【After replacement】

Q Series programmable controller		A0J2 renewal tool*3
・Main base unit(Q33B) ・Power supply module(Q62P)*1 ・CPU module ・I/O module	+	・Interface module ・Programmable controller fixing frame set*2 ・Programmable controller connection cable

*1: The interface modules except for some models require 24 V DC power supply. If the Q62P is not used, provide a separate external power supply.
*2: Includes a base adapter, mounting plate, mounting frame, terminal block, and power supply cable.
*3: See the following list for the applicable interface module.

■Compatible interface module list

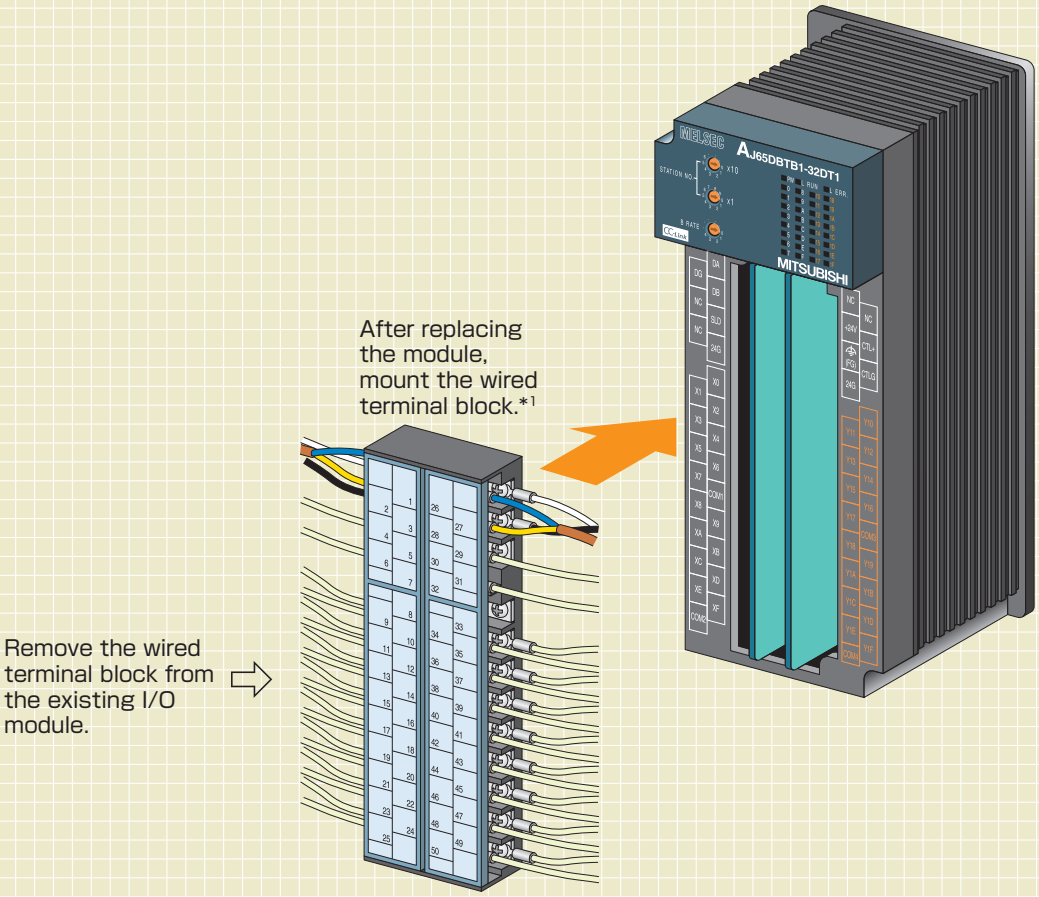
Discontinued model		Replacement interface module	Discontinued model		Replacement interface module
Input module	A0J2-E32A	SC-A0JQIF-32A	I/O module	A0J2-E28DS	SC-A0JQIF-28DS
	A0J2-E32D	SC-A0JQIF-32D		A0J2-E28DT	SC-A0JQIF-28DT
Output module	A0J2-E24R	SC-A0JQIF-24R		A0J2-E56AR	SC-A0JQIF-56AR
	A0J2-E24S	SC-A0JQIF-24S		A0J2-E56AS	SC-A0JQIF-56AS
	A0J2-E24T	SC-A0JQIF-24T		A0J2-E56DR	SC-A0JQIF-56DR
I/O module	A0J2-E28AR	SC-A0JQIF-28AR		A0J2-E56DS	SC-A0JQIF-56DS
	A0J2-E28AS	SC-A0JQIF-28AS		A0J2-E56DT	SC-A0JQIF-56DT
	A0J2-E28DR	SC-A0JQIF-28DR			

1. When upgrading to the Q Series module, programs do not need to be modified if the I/O combined module "QX41Y41P (32-point input for the first half and 32-point output for the second half)" is used. (Refer to page 17)
2. The A0J2 renewal tool can be used to replace MELSECNET/MINI compact type I/O modules (AJ35PTF-□ (such as 28AR and 56DR)) with CC-Link modules.
3. For products that are not described (such as connection cables for programmable controller), please contact your local Mitsubishi sales office or representative

A2C Shape CC-Link Remote I/O Module

Replace A2CCPU and NET/MINI-S3 I/O modules with CC-Link using existing NET/MINI-S3 wiring.

■The simple replacement process helps minimize the upgrade time.
The installation size is the same as that of A2C I/O modules; existing terminal block can be mounted directly.



*1: The communication cables and power cables need to be rewired.

■Model list

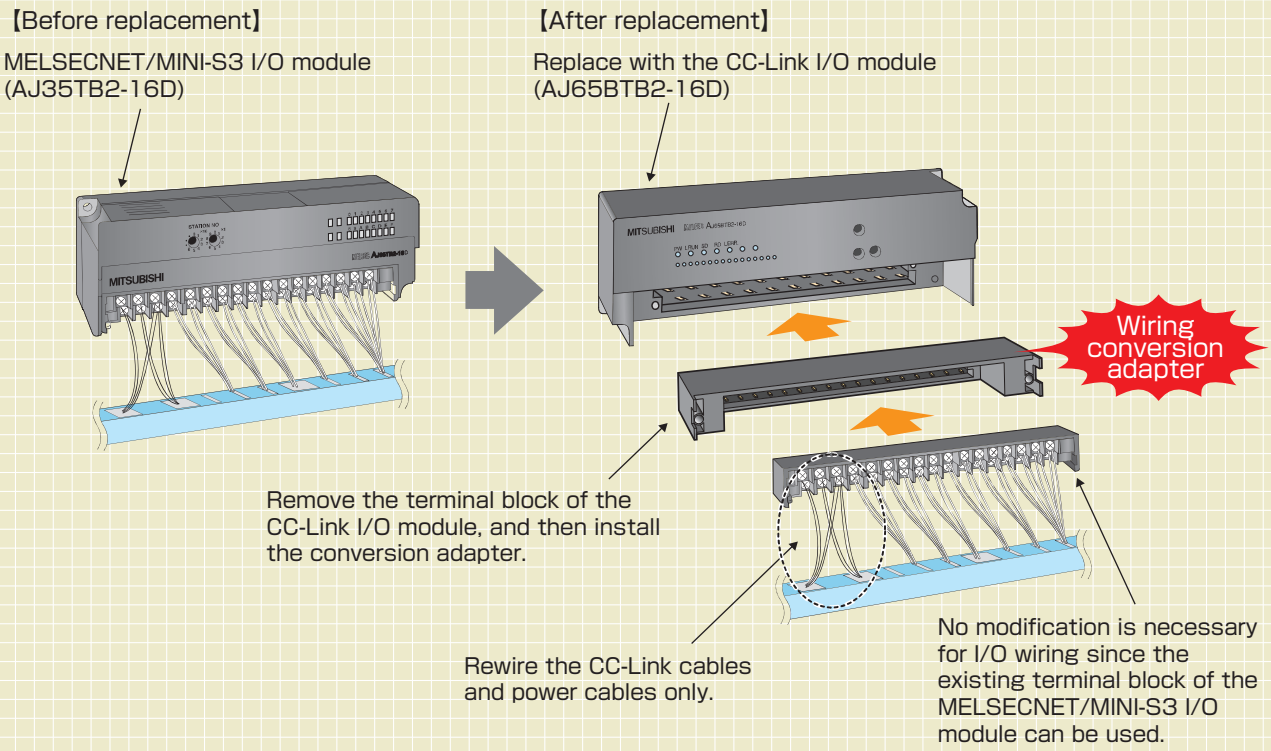
Discontinued model	Alternative model	
	Model	Outline
AX41C AX81C	AJ65DBTB1-32D	Terminal block type, 24 V DC input, 32 points, sink/source
AY51C	AJ65DBTB1-32T1	Terminal block type, 0.5 A transistor output, 32 points, sink
AX40Y50C	AJ65DBTB1-32DT1	Terminal block type, 24 V DC input, 16 points; 0.5 A transistor output, 16 points, I/O composite module
AY13C	AJ65DBTB1-32R	Terminal block type, relay output, 32 points
AX40Y10C	AJ65DBTB1-32DR	Terminal block type, 24 V DC input, 16 points; relay output, 16 points, I/O composite module

MELSECNET/MINI-S3 I/O Module Wiring Conversion Adapter

Replace NET/MINI-S3 systems with CC-Link while reusing existing NET/MINI-S3 wiring.

■Wiring adapter terminal blocks eliminate the need to rewire.

(Example) Replacing AJ35TB2-16D with AJ65BTB2-16D using a 34-pin conversion adapter



■Model list

Discontinued model		Alternative model		
Product name	Model	Model		Remarks (restrictions)
		Alternative module	Conversion adapter	
Input module	AJ35TB1-16D	AJ65BTB1-16D	Wiring conversion adapter for 26-point terminal block*1 A6ADP-1MC16D	*1: The overall size is increased due to addition of the adapter to the alternative module. *2: Additional wiring to CTL+ (External power supply for output) is required.
	AJ35TB2-16D	AJ65BTB2-16D	Wiring conversion adapter for 34-point terminal block*1 A6ADP-2MC16D	
Output module	AJ35TB1-16T	AJ65BTB1-16T	Wiring conversion adapter for 26-point terminal block*1, *2 A6ADP-1MC16T	

For Large Type A/QnA Series

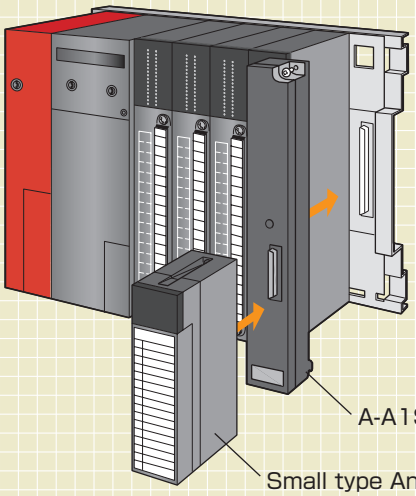
A-A1S Module Conversion Adapter

(A1ADP-XY: For I/O Modules
A1ADP-SP: For Special Function Modules)

Allows use of small type AnS Series modules when module addition to the A/QnA system is required.

■Direct replacement of an A Series module

Large type A Series base unit

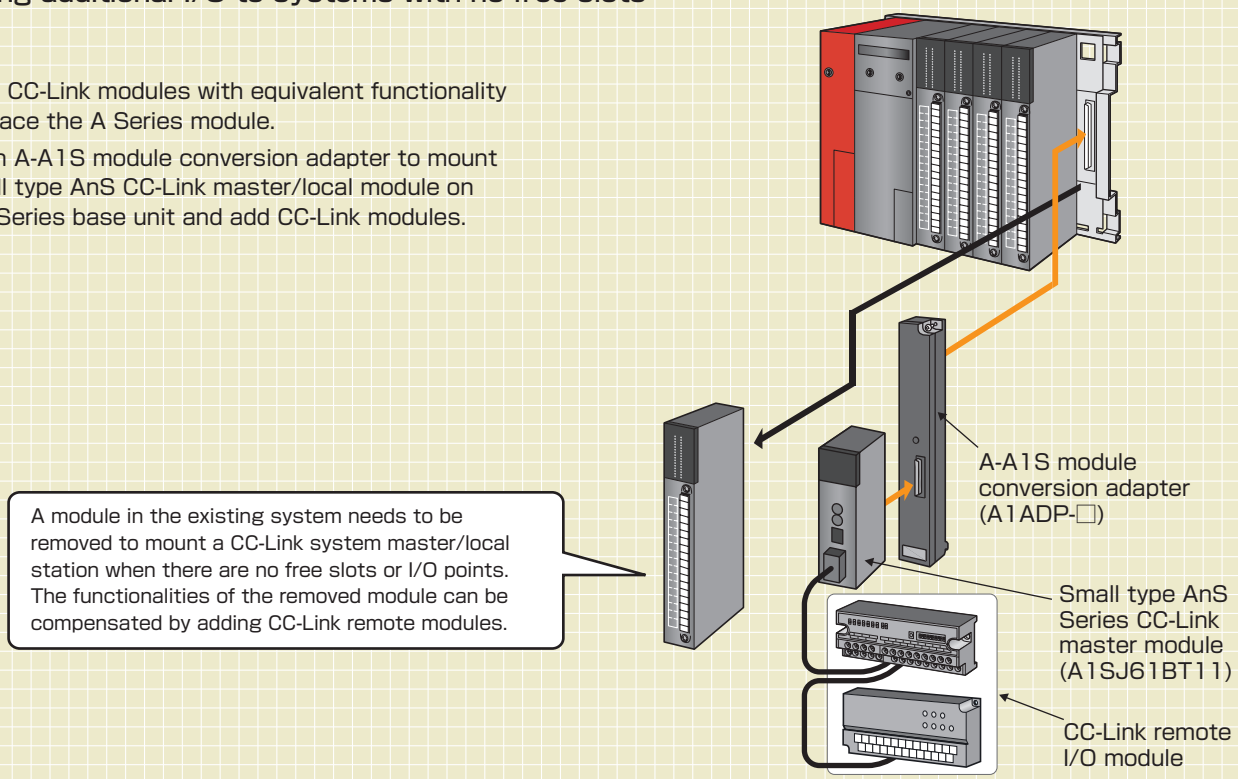


- Select a small type AnS module with equivalent functionality to replace the A Series module.
- Use the A-A1S module conversion adapter to mount the small type AnS module on the A Series base unit.
  * The existing system must have available slots and enough I/O points in order to mount the small type AnS module.

■Adding additional I/O to systems with no free slots

Large type A Series base unit

- Select CC-Link modules with equivalent functionality to replace the A Series module.
- Use an A-A1S module conversion adapter to mount a small type AnS CC-Link master/local module on the A Series base unit and add CC-Link modules.



- Up to three A-A1S module conversion adapters can be used per base unit.
- A-A1S module conversion adapters are compatible with the QA extension base unit and the large type A Series extension base unit (when QA conversion adapter (QA6ADP) is mounted).
- For details of applicable CPU modules, mountable modules, and supported adapters for each module, refer to the following manual.
  ・Product manual: A-A1S Module Conversion Adapter User's Manual (IB-0800352-E or later version)

Product List

List of products used for upgrade

Extension base unit

Product name	Model	Outline
QA(1S) extension base unit	QA1S51B	1 slot, for AnS Series modules (power supply module not required)
	QA1S65B	5 slots, for AnS Series modules
	QA1S68B	8 slots, for AnS Series modules
	QA65B	5 slots, for A Series modules
	QA68B	8 slots, for A Series modules

QA conversion adapter module

Product name	Model	Outline
QA conversion adapter module	QA6ADP	Adapter for connecting large type A/QnA extension base unit as QCPU extension base unit

Q Series large type base unit

Product name	Model	Outline
Main base unit	Q38BL	8 slots, 1 power supply module required, Q Series large type I/O module mountable
	Q35BL	5 slots, 1 power supply module required, Q Series large type I/O module mountable
Extension base unit	Q68BL	8 slots, 1 power supply module required, Q Series large type I/O module mountable
	Q65BL	5 slots, 1 power supply module required, Q Series large type I/O module mountable
	Q55BL	5 slots, power supply module not required, Q Series large type I/O module mountable

Product List

Q Series large type I/O module

Product name	Model	Outline
Input module	QX11L	32 points, 100 to 120 V AC, rated input current: 10 mA (100 V AC, 60 Hz), response time: 15 ms or less (OFF to ON), 25 ms or less (ON to OFF), 32 points/common, 38-point terminal block
	QX21L	32 points, 200 to 240 V AC, rated input current: 10 mA (220 V AC, 60 Hz), response time: 15 ms or less (OFF to ON), 25 ms or less (ON to OFF), 32 points/common, 38-point terminal block
Output module	QY11AL	16-point contact output, 24 V DC/240 V AC, 2 A/point, 16 A/all points, all points independent common, 38-point terminal block, surge suppressor (varistor 387 to 473 V)
	QY13L	32-point contact output, 24 V DC/240 V AC, 2 A/point, 5 A/common, 8 points/common, 38-point terminal block
	QY23L	32-point triac output, 100 to 240 V AC, 0.6 A/point, 2.4 A/common, 8 points/common, 38-point terminal block
	QY51PL	32-point transistor output (Sink), 12/24 V DC, 0.5 A/point, 4 A/common, 16 points/common, 38-point terminal block
Large type blank cover	QG69L	Blank cover for mounting existing Q Series module on the Q Series large type base unit

DC input module

Product name	Model	Outline
DC input module	QX41-S2	32 points, 24 V DC, rated input current: approximately 6 mA, positive common type, 32 points/common, response time: 1 ms/5 ms/10 ms/20 ms/70 ms or less (Set by the CPU parameter at the initial setting of 10 ms for both ON to OFF and OFF to ON)
	QX81-S2	32 points, 24 V DC, rated input current: approximately 6 mA, negative common type, 32 points/common, response time: 1 ms/5 ms/10 ms/20 ms/70 ms or less (Set by the CPU parameter at the initial setting of 10 ms for both ON to OFF and OFF to ON)

I/O combined module

Product name	Model	Outline
I/O combined module	QX41Y41P	Input specifications (positive common type) 32 points, 24 V DC, 32 points/common, response time: 1 ms/5 ms/10 ms/20 ms/70 ms or less (Set by the CPU parameter at the initial setting of 10 ms for both ON to OFF and OFF to ON) Output specifications (sink type) 32 points, 24 V DC, 0.1 A/point, 2 A/common, response time: 1 ms or less (OFF to ON), 1ms or less (ON to OFF, rated load, resistance load) Number of occupied I/O points: 64 points (32-point input for the first half and 32-point output for the second half)

High-speed counter module

Product name	Model	Outline
High-speed counter module	QD62-H01	High-speed counter module for replacing the AD61 (with the same input filtering system and counting speed)
	QD62-H02	High-speed counter module for replacing the AD61-S1 (with the same input filtering system and counting speed)

Positioning module New

Product name	Model	Outline
Positioning module	QD73A1	1-axis analog output type Position control mode (positioning control, two-phase trapezoidal positioning control) Velocity/position control switchover mode

MELSECNET/H twisted bus type network module

Product name	Model	Outline
MELSECNET/H twisted bus type network module	QJ71NT11B	MELSECNET/H twisted pair cable, single bus, for control/normal station

MELSECNET(Ⅱ), MELSECNET/B local station data link module

Product name	Model	Outline
MELSECNET(Ⅱ) local station data link module	A1SJ71AP23Q	MELSECNET(Ⅱ) local station data link module for SI optical fiber cable
	A1SJ71AR23Q	MELSECNET(Ⅱ) local station data link module for coaxial cable
MELSECNET/B local station data link module	A1SJ71AT23BQ	MELSECNET/B local station data link module for shielded twisted pair cable

MELSECNET(Ⅱ)-MELSECNET/10 gataway set

Product name	Model	Outline
MELSECNET(Ⅱ)-MELSECNET/10 gateway set	Q6KT-NETGW-SS	A set of A1S35B, A1S61PN, Q2ASCPU, A1SJ71AP21, and A1SJ71QLP21
	Q6KT-NETGW-RS	A set of A1S35B, A1S61PN, Q2ASCPU, A1SJ71AR21, and A1SJ71QLP21
	Q6KT-NETGW-RB	A set of A1S35B, A1S61PN, Q2ASCPU, A1SJ71AR21, and A1SJ71QBR11
MELSECNET/B-MELSECNET/10 gateway set	Q6KT-NETGW-TS	A set of A1S35B, A1S61PN, Q2ASCPU, A1SJ71AT21B, and A1SJ71QLP21
	Q6KT-NETGW-TB	A set of A1S35B, A1S61PN, Q2ASCPU, A1SJ71AT21B, and A1SJ71QBR11

Product List

Q Series redundant system extension base unit

Product name	Model	Outline
Redundant system extension base unit	Q65WRB	5 slots, for Q Series modules

A2C shape CC-Link remote I/O module

Product name	Model	Outline
CC-Link remote I/O module (Screw/2-piece terminal block, dustproof type)	AJ65DBTB1-32D	Input: 32 points, 24 V DC (positive/negative common [sink/source]), terminal block 1-wire type, response time: 10 ms
	AJ65DBTB1-32T1	Output: 32 points, 12/24 V DC, 0.5 A transistor output (sink), terminal block 1-wire type (low leakage current type)
	AJ65DBTB1-32R	Output: 32 points, 24 V DC/240 V AC, 2 A relay output, terminal block 1-wire type
	AJ65DBTB1-32DT1	Input: 16 points, 24 V DC (positive common [sink]), 1-wire type, high-speed response, response time: 10 ms Output: 16 points, 24 V DC, 0.5 A transistor output (sink), terminal block 1-wire type (low leakage current type)
	AJ65DBTB1-32DR	Input: 16 points, 24 V DC (positive/negative common [sink/source]), response time: 10 ms Output: 16 points, 24 V DC/240 V AC, 2 A relay output, terminal block 1-wire type

MELSECNET/MINI-CC-Link wiring conversion adapter

Product name	Model	Outline
MELSECNET/ MINI-S3-CC-Link wiring conversion adapter	A6ADP-1MC16D	26-pin conversion adapter, 1-wire type, 16-point input (with CTL+ terminal), CC-Link module dedicated adapter
	A6ADP-1MC16T	26-pin conversion adapter, 1-wire type, 16-point output (with CTL+ terminal), CC-Link module dedicated adapter
	A6ADP-2MC16D	34-pin conversion adapter, 2-wire type, 16-point input, CC-Link module dedicated adapter

A-A1S module conversion adapter

Product name	Model	Outline
For I/O modules	A1ADP-XY	Adapter for mounting small type AnS/QnAS Series I/O module on a large type A/QnA base unit and QA extension base unit
For special function modules	A1ADP-SP	Adapter for mounting small type AnS/QnAS Series special function module on a large type A/QnA base unit and QA extension base unit

Models in continuous production

The production of the following A/QnA Series products discontinued at the end of September 2006, will be continued.

Note: In accordance with the continuation of production, model names may be changed.

Power supply module

Product name	Model
Large type A/QnA Series power supply module	A61PN*1
	A63P*2
	A61RP

If using power supplies other than the above, please consider switching over to one of the above models.
*1: A61PN is a replacement of A61P/A61PEU/A61P-UL.
*2: The production of A63P modules will be discontinued as of October 31, 2012. (Refer to technical bulletin FA-A-0108.)

Battery

Product name	Model
Battery	A6BAT

MELSECNET/10 network module

Product name		Model
Large type A/QnA Series MELSECNET/10 network module	Control/normal station	AJ71BR11
		AJ71LP21
		AJ71LP21G
		AJ71LR21
		AJ71QBR11
		AJ71QLP21
		AJ71QLP21G
		AJ71QLP21S
		AJ71QLR21
	Remote I/O station	AJ72BR15
		AJ72LP25
		AJ72LP25G
		AJ72LR25
		AJ72QBR15
		AJ72QLP25
		AJ72QLP25G
		AJ72QLR25

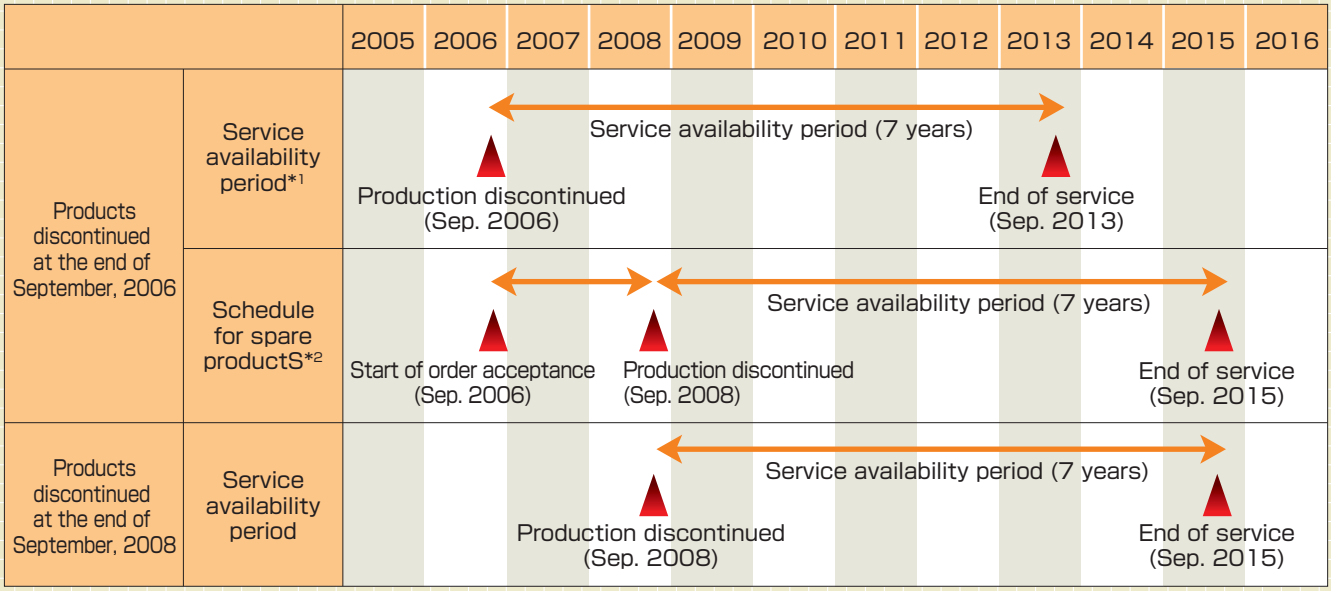
The production of specific MELSEC-A/QnA Series models has been continued, however, due to the expiration of EN61131-2:2003, the CE declaration will only be effective until July 31, 2010.

Product List

Discontinued products

Discontinued products		Date of discontinuation
Large type A Series/ Large type QnA Series	●CPU module ●I/O module ●Special function module ●Data link module (MELSECNET(Ⅱ), MELSECNET/B module, etc.)	End of Sep. 2006
A2C Series	●CPU module	End of Sep. 2006
	●A2C I/O module ●Special function module etc.	End of Sep. 2008
PC interface board	●MELSECNET(Ⅱ), MELSECNET/B interface board	End of Sep. 2008
Small type AnS data link module	●MELSECNET(Ⅱ)(A1SJ71AP21-S3), MELSECNET/B data link remote I/O module (A1SJ72T25B)	End of Sep. 2008
	●MELSECNET/MINI-S3 AnS master module (A1SJ71PT32-S3) ●MELSECNET/MINI-S3 I/O module	End of Sep. 2008
A0J2(H) Series	●CPU module ●Power supply module ●I/O module ●Special function module etc.	End of Sep. 2008

Service availability period



*1: For details of the service availability period of discontinued products, refer to the Technical Bulletin (FA-A-0049).
*2: Production of selected products , which were discontinued at the end of September 2006 (Technical Bulletin No. T99-0050), were extended until end of September 2008 as spare. However, its continued production has ended as of the end of September 2008.

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Mitsubishi Programmable Controllers
MELSEC-A/QnA Series Transition Guide

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